antenna, which cannot be easily done in the ARS, and is pointless in residential neighborhoods permeated by BPL radiated emissions.

39. At paragraph 130 of the R&O, the Commission refuses to require BPL systems deployed before a date 18 months after publication of the R&O in the Federal Register to come into compliance with the new rules, unless the system causes harmful interference and the operator fails to take necessary steps to eliminate occurrences of harmful interference. ***As the result of this holding, and given the language of the revised Section 15.37(l), it is apparent that the BPL facilities installed before July 7, 2006 never have to come into compliance with the new rules***! This is absurd. As incomplete and ineffective as the new rules are, a BPL system not yet in operation cannot be allowed to skirt the rules supposedly limiting interference potential permanently.

40. Finally on the subject of "mitigation" techniques, the publicly accessible database of BPL operations, which need only include the location of an installation by zip codes served, type of modulation used, frequency bands of operation, and a contact person, who need be available only during normal business hours, is useless in addressing instances of mobile radio interference, which must be avoided, rather than remedied. Public safety communications are not protected at all by this requirement.

VII. The Commission has Failed to Respond to Harmful Interference Complaints From BPL Test Sites

41. ARRL's experience to date has confirmed that the Commission cannot be relied on to address the interference cases that require its intervention. The recitation in ***Exhibit D***, attached, reveals the circumstances of the Commission's complete inaction to date in adjudicating complaints filed concerning test sites. If the Commission has even visited these sites, it has not contacted the complaining radio amateurs in the area, nor communicated with them.

VIII. The Commission's Adopted Measurement Standards Are Incorrect

42. The NTIA Phase 1 interference study recommended measurement of BPL emissions at a fixed measurement distance of 10 meters, using a height roughly equal to the power line height, using an adjustment factor for higher emissions at higher elevation angles, making measurements with a rod antenna below 30 MHz instead of a loop antenna. ARRL agreed with those recommendations. They were in each case based on sound science. None of these recommendations was adopted by the Commission.

43. NTIA, in a September 24, 2004 letter to the Commission, retreated inexplicably from its argument for a 5 dB height correction factor, (to avoid the need to search for a peak field in the height dimension) and now claims the factor is not needed below 30 MHz except as an alternative to varying the measurement antenna height as proposed by FCC. Thus, the Commission has allowed multiple measurement standards. Since measurements at 1-4 meters of height are allowed, the results of radiated emissions testing will be misleading since the maximum radiation is not at 4 meters, but much higher.

44. Though the Commission retained *in situ* measurement requirements for Access BPL systems, it decided that it was not practical to measure radiated emissions at fixed distances of 10 and 3 meters. So, distance extrapolation will be necessary. The Commission rejected ARRL's and ARINC's recommendation of a 20 dB per decade extrapolation factor and uses the existing 40 dB per decade factor in Part 15 for frequencies below 30 MHz, using slant-range rather than horizontal distance. The 40 dB per decade factor is unreasonable for BPL systems. It underestimates the actual field strength at 30 meters by as much as 11.5 dB. The technical study submitted as ***Exhibit E*** hereto justifies this conclusion, and the Commission's revisiting of measurement issues and standards.

45. NTIA's recommendation for antenna height for measurements and a correction factor was adopted only as an alternative procedure, not a mandatory one. This is illogical. There should be

only one measurement standard; otherwise, there will be substantial differences in maximum radiated emission levels and no objective means of evaluation of a compliant system. Allowing multiple standards allows both cherry picking, and waffling by BPL operators who do not wish to comply with the limits. Similarly, NTIA's recommendation for measurement all along a 1200-meter section of the connected power line wiring was rejected on the basis that it is "burdensome" for BPL operators. Yet, the Commission admitted that the wiring may be many miles long, and the maximum emission from the system often occurs further down-line from the coupler than the one-wavelength maximum adopted in the Rules. This admits the distributive nature of Access BPL, not conceded by the Commission earlier, and does not contribute to a determination of the maximum radiated emission level.

Therefore, for all of the above reasons, ARRL, the National Association for Amateur Radio, respectfully requests that the Commission reconsider, rescind and re-study in further proceedings the rules governing Access Broadband Over Power Line systems in accordance with the foregoing.

Respectfully submitted,

ARRL, THE NATIONAL ASSOCIATION FOR AMATEUR RADIO

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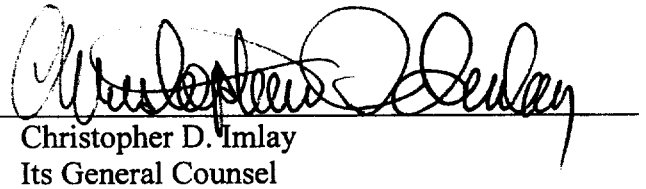
By: 
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February 7, 2005

EXHIBIT A

EXHIBIT A
ARRL PETITION FOR RECONSIDERATION

CIRCUMSTANCES AND CASE LAW SURROUNDING FCC CHAIRMAN POWELL'S VISIT TO MANASSAS, VIRGINIA ON OCTOBER 12, 2004

On or about Friday, October 8, 2004, the following was discovered by ARRL on a TV Technology web site:

Date posted: 2004-10-08
FCC Chairman to Attend BPL Demo in Manassas, Va.

Two chief regulators will attend a demonstration of Broadband over Power Lines (BPL) technology, Tuesday, Oct. 12, at 9:30 a.m.

FCC Chairman Michael Powell and Federal Energy Regulatory Commission Chairman Pat Wood, III will view first-hand the BPL services offered by the City of Manassas, Va.

Manassas is one the first cities to offer high-speed Internet service over power lines.

There is concern in the broadcast community about interference from BPL, and the difficulties of getting it mitigated. Industry experts have said that while the law enjoins BPL providers from interfering with TV signals, enforcement has been lacking.

The event will begin at 9:30 a.m. at the Manassas Public Works building, 8500 Public Works Drive, Manassas, Va., and last approximately 90 minutes. The two chairmen will see the capabilities of BPL for Internet service, VoIP and utility and public works functions.

Directions to the Manassas Public Works Building can be obtained by contacting Meribeth McCarrick at the FCC at 202-418-0654 or Meribeth.Mccarrick@fcc.gov.

On that date, time being short due to the fact that Monday, October 11, 2004 was a Federal Holiday, and because the presentation was to have occurred early on October 12, 2004, counsel for ARRL sent a complaint via E-mail concerning the apparent, planned participation of Commission Chairman Michael K. Powell in a prohibited *ex parte* presentation on BPL. The presentation was to occur only two days prior to the scheduled Sunshine Act Agenda meeting, and clearly within the period in which presentations to decisionmaking personnel were prohibited. The E-mail complaint in advance of the *ex parte* presentation was addressed to Chairman Powell; his legal assistant; the FCC Office of Engineering and Technology Chief; the FCC Office of Engineering and Technology Deputy Chief; the FCC Inspector General; and the FCC General Counsel. No response from any of those addressees was received.[1] Telephone

[1] A subsequent telephone call from ARRL Counsel to the Inspector General resulted in a referral to the Office of the General Counsel, and specifically to an attorney there who did not return a telephone call to ARRL Counsel.

calls to the Office of the Chairman, to the Office of the General Counsel, to the Office of Engineering and Technology, and to the Media Office at FCC, went unanswered. It was, until late on Tuesday, October 12, 2004, impossible to verify from FCC offices, despite repeated efforts, that the Chairman did in fact attend the BPL demonstration in Manassas, Virginia, together with unspecified other Commission staff, including his Legal Assistant.

It was verified by staff of the City of Manassas, Virginia, and via certain print and broadcast network reporters, that the Chairman was in fact in attendance at the BPL demonstration at the City of Manassas, and that video of his participation was available. The presentation included a discussion by the Chairman concerning interference from BPL to licensed radio services (one of the main issues for resolution in the instant proceeding).

Because Commission Chairman Powell intentionally participated in the BPL presentation by the City of Manassas, Virginia, and because he either knew or should have known that his participation in that presentation is in clear violation of Section 1.1203 of the Commission's Rules, ARRL asserted in a motion filed October 12, 2004, asking the Chairman to recuse himself from consideration of a Report and Order in this proceeding, that the proceeding would otherwise be irrevocably tainted. ARRL thus requested that the Chairman recuse himself from any further participation in this proceeding, and that he not participate in the deliberations concerning this matter at the Open Meeting on October 14, 2004. This violation could not be cured by a public notice pursuant to the provisions of Section 1.1212 of the Commission's Rules, given that the totality of the presentation was not written; it involved innumerable and unidentified advocates; and because the interested parties in the instant proceeding were not present at the prohibited presentation in Manassas that day.

Late on October 13, 2004 (too late to seek any judicial relief prior to the Commission's Open Meeting), the Commission's General Counsel sent by facsimile to the office of Counsel for ARRL a letter denying both the October 8, 2004 complaint of violation of the *ex parte* rules by FCC Chairman Powell and the October 12, 2004 *Motion for Recusal of Chairman Michael K. Powell.*

The applicable rule, Section 1.1203(a), states as follows:

§ 1.1203 Sunshine period prohibition.

(a) With respect to any Commission proceeding, all presentations to decision-makers concerning matters listed on a Sunshine Agenda, whether ex parte or not, are prohibited during the period prescribed in paragraph (b) of this section unless:

(1) the presentation is exempt under § 1.1204(a)...

The remainder of the exceptions in this section are not relevant in this instance, nor did the Commission's General Counsel claim them to be. No portion of Section 1.1204(a) applied to the Chairman's attendance at the BPL demonstration in Manassas during the prohibited period.

This demonstration, hosted by the City of Manassas, included a press conference touting BPL, and a question and answer session involving Chairman Powell and FERC Chairman Pat Wood, at which the interference potential of BPL was discussed. It is unclear what oral information was provided to Powell at the Manassas meeting on October 12th or by whom. It is further impossible to determine what information was presented to Powell by FERC Chairman Wood or by members of the Manassas City Government. Press reports ARRL has obtained indicate that Powell discussed lowering uncertainty about regulation so as to spur development of BPL. According to a news release from The City of Manassas Director of Utilities, Alan Todd, the purpose of the demonstration was to "showcase BPL for utility and public works functions, and to show Chairman Powell "the benefits our residents and businesses have enjoyed and will continue to reap with BPL technology." Powell also reportedly commented on FCC testing of interference parameters and the potential of BPL for interference.

The Commission's General Counsel's letter cites only one subsection of Section 1.1204(a) that allegedly applies to this matter. Section 1.1204(a)(10) exempts presentations that "are requested by (or made with the advance approval of) the Commission or staff for the clarification or adduction of evidence, or for resolution of issues, including possible settlement, subject to the following limitations..." Among the limitations regarding oral presentations is a disclosure requirement, including a detailed summary of the presentation filed in the proceeding, with an opportunity to respond by other parties.

According to the Commission's General Counsel, "[a]ny presentations made pursuant to Chairman Powell's voluntary attendance at the demonstration were authorized by him and therefore fall within the exception." On this basis, then, the Chairman can determine whether or not he wishes to comply with Section 1.1203 by either asking for or refraining from asking for the presentation. This renders Section 1.1203 effectively meaningless, and encourages collusion, if it can be manipulated by the Chairman to suit his own views or personal interest in a given proceeding. Section 1.1204(a)(10) was formerly Section 1.1204(b)(7). According to *Comcast Cable Communications, Inc.*, 11 FCC Rcd. 4029 (1995), the purpose of the former iteration of that same exception is to permit the staff to seek the narrowing of issues in a proceeding, to attempt to settle a case, or to supplement the record, or so that the proceeding could be resolved on the basis of a more complete record, or through more expeditious procedures. A note to that section clarifies that if any such contact elicits new information, that information must be served on all parties to the proceeding. The purpose of this provision is to ensure that interested parties have fair notice of the substance of the new information that has been provided and thus have a fair opportunity to provide their own views on the information. From that case decision, two arguments suggest themselves. First, the purpose of the exception is not to allow the FCC Chairman to have a news conference, or

to receive *ex parte* arguments from innumerable persons associated with a local government and its BPL provider whose interests are in touting an unlicensed technology and discounting interference concerns of incumbent licensees. Rather, the purpose is to obtain missing or needed information before a decision is reached concerning an evidentiary or informational item (apparently principally in adjudicatory matters, which this proceeding is not). Second, the disclosure requirement would have necessitated a far different circumstance than the Chairman's attendance at a demonstration involving other Federal agencies and advocates of one side of an issue. No time existed prior to the FCC Open Meeting to make any disclosure of the oral presentations made, the arguments offered, or the assertions concerning interference, and the parties to this docket proceeding, numbering over 5,000, including ARRL, were not given any opportunity to respond to the presentations made.

According to *In the Matter of New York Telephone Company*, 69 RR 2d 428, 6 FCC Rcd. 3303 (1991), the purpose of the exception under (former) Section 1.1204(b)(7) was to "avoid constraints upon agency staff in...attempting to reach settlement agreements...." or resolving issues. This case too reiterated that any new information offered during an oral presentation under the exception must be disclosed. "New information" in this context means only new facts or arguments not already reflected in the pleadings. However, in the context of the Chairman's attendance at this meeting, it is impossible to determine what arguments, points or allegations were made by innumerable presenters, and of course no summary of the presentation was made in the record, and no opportunity existed for any of the thousands of interested parties to rebut any claim or argument made. The Chairman did not list all persons with whom he spoke during his visit, nor those presentations made to his Legal Assistant, who accompanied him. Whether there was other Commission staff in attendance is unclear.

The same discussion of the basis for the exception which is now Section 1.1204(a)(10) is in *In the Matter of Cox Communications, Inc. and Times Mirror Cable Television, Inc.*, 11 FCC Rcd. 4029 (1995). The Commission held that the purpose of the exception is to permit the staff to seek the narrowing of issues in a proceeding, to attempt to settle a case or to supplement the record, so that the proceeding can be resolved on the basis of a more complete record, or through more expeditious procedures. If any such contact elicits new information (which in this case it obviously did, since some of that information was alluded to by the Chairman at the Open Meeting, which ARRL representatives heard for the first time there) that information must be served on all parties to the proceeding. That was not done in this case. However, where it is burdensome to do so (as in this case where there are more than 5,000 commenters) the Commission has the option of releasing a public notice notifying the public that new information was received and placing it in the record, available for public inspection. That of course was not done here, nor could it have been on a practical basis, since the information to the Chairman was from a multitude of sources. At the very least, the Commission could have forestalled the proceeding, pending an opportunity for interested parties to examine the new information and comment on it. That did not happen either.

The legality of the Section 1.1204(b)(7), now 1.1204(a)(10) procedures were upheld in *New York State Department of Law v. FCC*, 984 F. 2d 1209 (D.C. Cir. 1993). In that case, the Court cited FCC rules and held that an oral contact is *ex parte* if the agency fails to provide "the parties to the proceeding" with "advance notice and an opportunity to be present". The Commission violates its *ex parte* rules only if the proceeding is restricted and if the agency fails properly to communicate with a "party" to the proceeding. The exception is for the purpose of achieving settlement in disputed (typically adjudicatory) proceedings. There is nothing in FCC jurisprudence which would indicate that the cited exception is applicable to rulemaking where the Chairman elects to participate in a demonstration at a municipality before innumerable presenters two days prior to an FCC open meeting which includes on the agenda the very issue about which the Chairman was receiving open-ended oral input. Even if the exception applied, and even if the Chairman can thwart Section 1.1203(a) by his own fiat (a highly dubious interpretation which ARRL rejects) the application of the exception is premised upon public disclosure of new information adduced. No public notice was issued of the presentations made, and the parties to this docket proceeding were not provided with a notice of any information that was adduced, all of which was arguably relevant to the parties which filed comments in the docket proceeding, including ARRL. It is therefore urged that (1) the exception is not applicable, and (2) even if it was, the very specific disclosure requirements that are triggered by the exception were not complied with in this case.

EXHIBIT B

EXHIBIT B
ARRL PETITION FOR RECONSIDERATION

ANALYSIS OF FCC BPL FIELD TEST RESULTS

In the R&O, the Commission reached the following general conclusions:

- The present BPL test systems are in generally in compliance with the emissions limits.
- The interference potential of BPL is low and interference incidents will be rare.
- Interference that did occur can be easily corrected by BPL operators.
- BPL systems will not radiate for considerable distances along the power lines.
- BPL systems will not act as if they are connected to long antennas.
- It is feasible to measure radiated emissions only near BPL devices connected to power lines.
- BPL noise will not cause harmful interference at any considerable distance perpendicular from power lines or BPL equipment.
- BPL noise will not appreciably degrade the ambient noise levels near BPL systems.
- The Commission does not accept the value of 0 dBuV/m proposed by ARRL to protect mobile operation in the Amateur Radio Service.
- The Commission concluded that because of all these factors, the emissions limits for BPL did not need to be changed. Other than reducing the permitted emissions in 13 protected bands of spectrum essential to government operations, the Commission will continue to rely on industry compliance with the provision in the Part 15 rules requiring that unlicensed devices not cause harmful interference.

The FCC presentations, ostensibly released because they support the Commission's conclusions in the R&O, do not contain as much technical detail as typical test-result reports. In some cases, a test-equipment list was provided, but even in these cases, it is usually not possible to determine just what equipment and test conditions were used to perform each specific test, including analyzer settings or which antenna was used. These omissions would have made it equally difficult for the Commission to draw technical conclusions solely from this information. As indicated in the presentations themselves, the testing that was performed was done for scientific investigation, not to assess compliance with Commission Part 15 rules. To that end, the testing consisted of a combination of average-power measurements, peak measurements, peak-hold measurements and some limited quasi-peak measurements that were done to ANSI C63.4 standards.

ARRL performed similar measurements to the testing the FCC describes in these presentations, in some cases on the same BPL system. ARRL test results are consistent with the findings of the Commission. In general, the Commission's findings show:

- Some of these systems exceeded the absolute radiated emission limits.
- The emissions from BPL were strong along long sections of overhead power lines.
- The emissions from BPL were strong at significant distances from BPL equipment.
- The point of maximum emissions from BPL equipment can occur at a considerable distance from the source.
- The emissions from *un-notched* BPL were much stronger than ambient signal levels often used by operators in the Amateur Radio Service for communications.
- The emissions from *notched* BPL were typically 10 to 20 dB higher than the ambient signal levels often used by operators in the Amateur Radio service for communications.
- The ambient noise levels without BPL were at the same approximate level as those found by ARRL.

As was noted by ARRL in its tests, even though the Commission performed only very limited testing, some of the systems exceeded the emissions limits. This was not always possible to determine conclusively from the Commission data because much of the Commission testing was not done in accordance with the appropriate ANSI C63.4 standards. The Commission's staff performed a combination of average-power, peak, peak-hold and quasi-peak testing. In general, from the data in the graphs, it appears that quasi-peak readings would be approximately 8 dB higher than average-power readings and that peak or max-hold measurements are 12 dB greater than average-power readings.

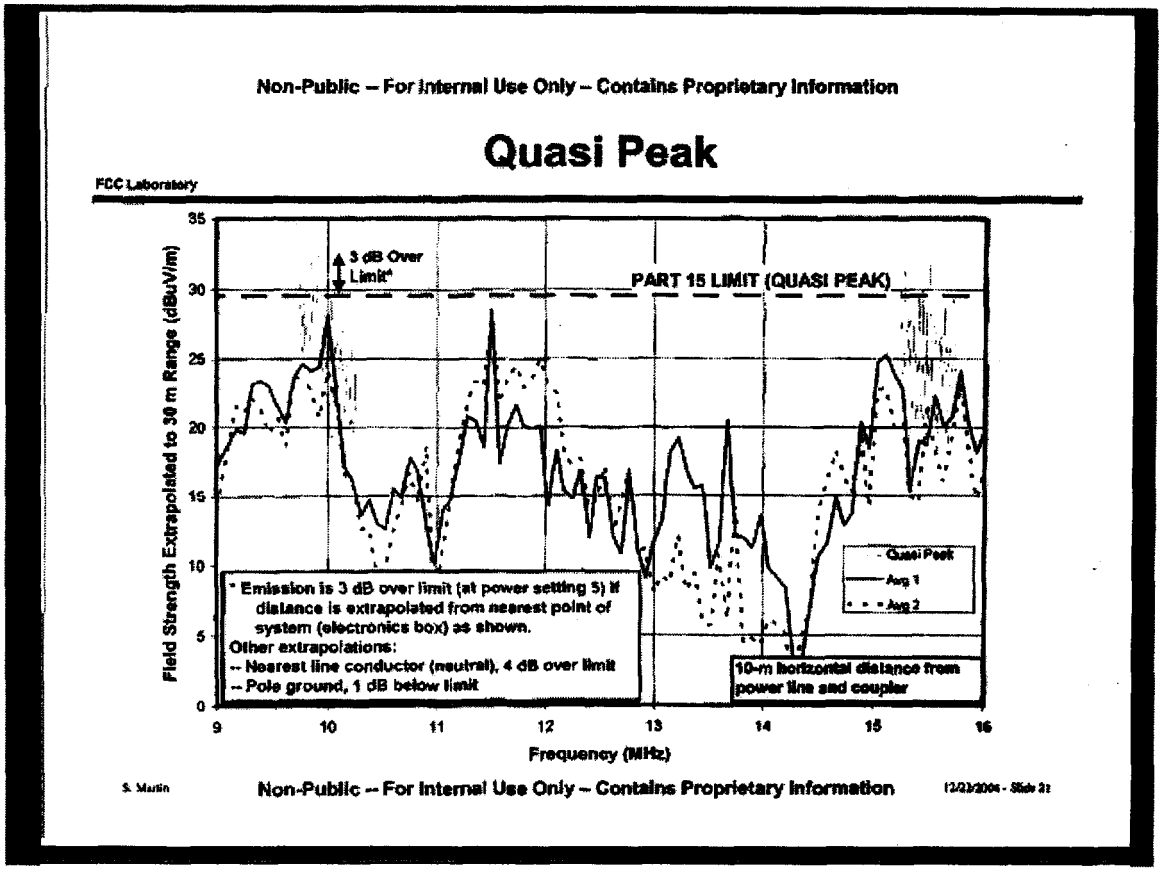

Figure 1 -- This graph shows the approximate correlation between average and quasi-peak readings (the quasi-peak line is very hard to read in the FCC-reproduced data). In this case, quasi-peak is approximately 8 dB higher than the average readings. Two separate average reading lines are presented in this graph, and it must be noted that the repeatability between the two readings is generally not good. There are two areas where the data are different by 4 to 8 dB or so. It is probable that quasi-peak readings could also vary by that much between two separate readings.

In this report, the Commission has provided data or otherwise concluded that systems did not or may not have met the FCC emissions limits[1]:

- The Main.net system in Allentown, PA was operating from 3 to 11 dB over the limits.

[1] To obtain the estimate used to draw these conclusions, if the FCC graphical data were derived from average-power measurements, 8 dB was added to the field-strength values. If the data were derived from peak or peak-hold values, 8 dB was subtracted. The data were generally taken at a slant-range distance of approximately 10 meters, although the actual distance was not shown on most graphs. A level of 49 dBuVm/m adjusted as described above was presumed to be the limit at the measurement distance. If a 20-dB/distance decade extrapolation were used, many more measurements would exceed the emissions limits.

- The Current Technologies system in Potomac, MD was operating from 4-8 dB over the limits.

- A calculation made from the Received Signal Levels (RSLs) in the report of the Ambient system in Briarcliff Manor, NY shows that the system may have been operating at 10 or more dB over the limits, although it should be noted that these were not calibrated measurements that could have been used by the Commission staff to draw any firm conclusions about whether BPL systems generally comply with the rules.

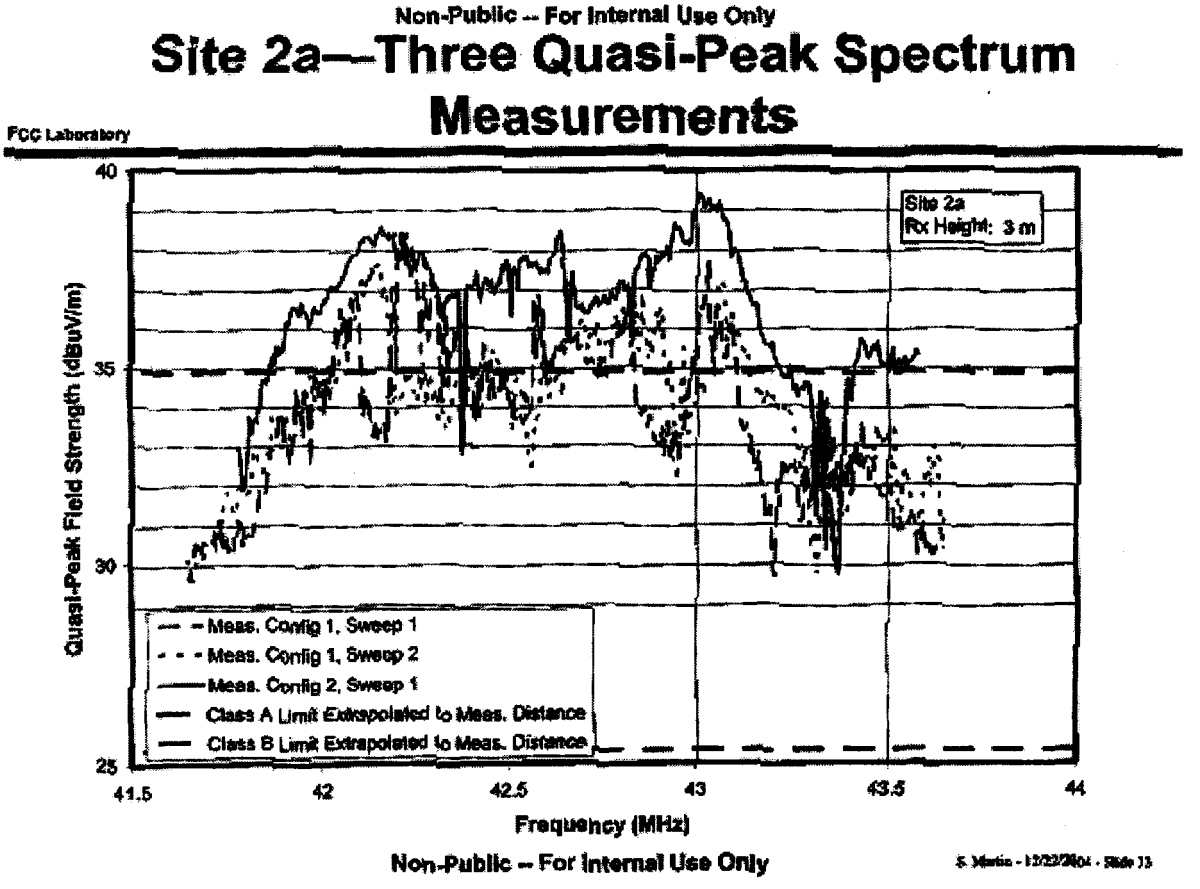

Figure 2 -- This graph represents data collected from the Current Technologies system in Potomac, MD. The data were taken with a quasi-peak detector and the precise value of the FCC limits at the measurement distance used. This system was operating approximately 8 dB over the FCC limits for Class-A emitters on the spectrum tested.

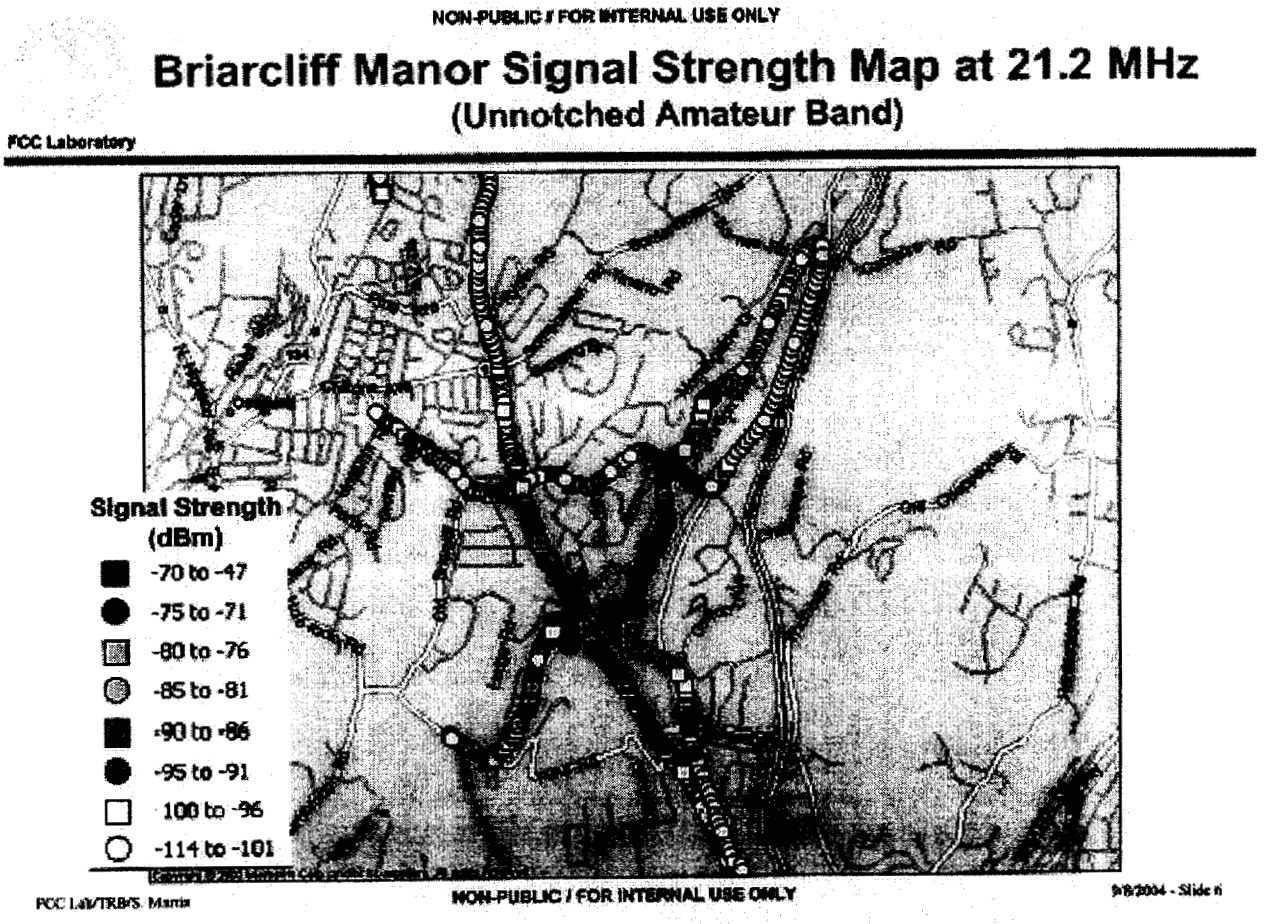

Figure 3 -- These data were collected in Briarcliff Manor, NY. A typical HF mobile whip was used and received signal levels (RSL) in a 5.5 kHz bandwidth were recorded. The maximum level of –70 dBm to –47 dBm was seen along long lengths of roads in two sections of the village. A typical 21-MHz mobile whip antenna has a gain of approximately –2.5 dBi. This is an antenna factor of –0.8 dB/m. Under these circumstances, an RSL of –47 dBm represents an estimated field strength at the antenna of 59 dBuV/m.

The rules changes the Commission recently enacted will require that measurements be made at 1-meter height and that 5 dB be added to the measured values to extrapolate to the field strength that is expected to be at a higher level at greater heights. Most of the measurements made for these FCC reports were made at heights near 1 meter. (However, 5 dB was not added to the results because at the time the measurements were conducted, no such requirement existed). In many cases, systems and locations documented in these reports were *only barely* in compliance with the emissions limits. If 5 dB were added to the measured values, more of these measurements would have been out of compliance and any degree of non-compliance would have been worse.

Of note and significance, ARRL staff performed measurements in Briarcliff Manor, NY soon after the Commission had visited the site. ARRL staff found several

additional locations where the emissions appeared to be not in compliance with the emissions limits. One of these was in an area that had been measured by the Commission, but on a frequency apparently not tested by the Commission staff. The strongest signal measured by ARRL was in the 3.5-4 MHz Amateur allocation, at approximately 71.9 dBuV/m at the mobile-whip test antenna on 3.5 MHz, measured along Park Road. This represented a field strength of approximately 52 dBuV/m extrapolated using 40 dB/decade[2]. A report of this testing was provided to Commission staff. ConEd has subsequently reduced the emissions levels at this location on that frequency.

Consistently in these graphical data, the Commission's measurement results showed what ARRL demonstrated in its submissions in the instant proceeding -- BPL emissions occur at strong levels over long sections of overhead line. In Figure 3, shown above, signal strengths exceeding S9 (-73 dBm) are evident along overhead lines. ***The Commission conclusion that BPL systems will not cause widespread harmful interference and that power lines will not function as antennas along "countless miles" of their length is not supported by the Commission's own test data if BPL devices are deployed at the spacing found in some of these installations***. This is seen in both the measurements as shown above and in other graphs or data from the FCC reports that show that BPL creates strong, measurable radiated emissions at significant distances from the BPL source connected to the lines.

The following are examples of these FCC measurements and conclusions:

- In Potomac, MD, BPL emissions measured at significant strength 230 meters midway between two BPL sources.

- In Emmaus, PA, BPL 100 meters down-line typically only 8 dB lower than at source. Levels of up to 52 dBuV/m shown, equivalent to S9+30 dB on 7 MHz.

- In Briarcliff Manor, NY the slides and data show dramatically that BPL is strong for considerable distances along overhead power lines.

- In Raleigh, NC the slides and data show dramatically that BPL is strong for considerable distances along overhead power lines.

- In Raleigh, NC the slides and data show that BPL emissions are strong enough to cause harmful interference (14-27 dB above ambient noise) for considerable distances along overhead power lines in the "notched" spectrum area.

[2] A report of this testing was provided to FCC staff, but a formal complaint was not filed. ConEd has subsequently corrected this rules violation.

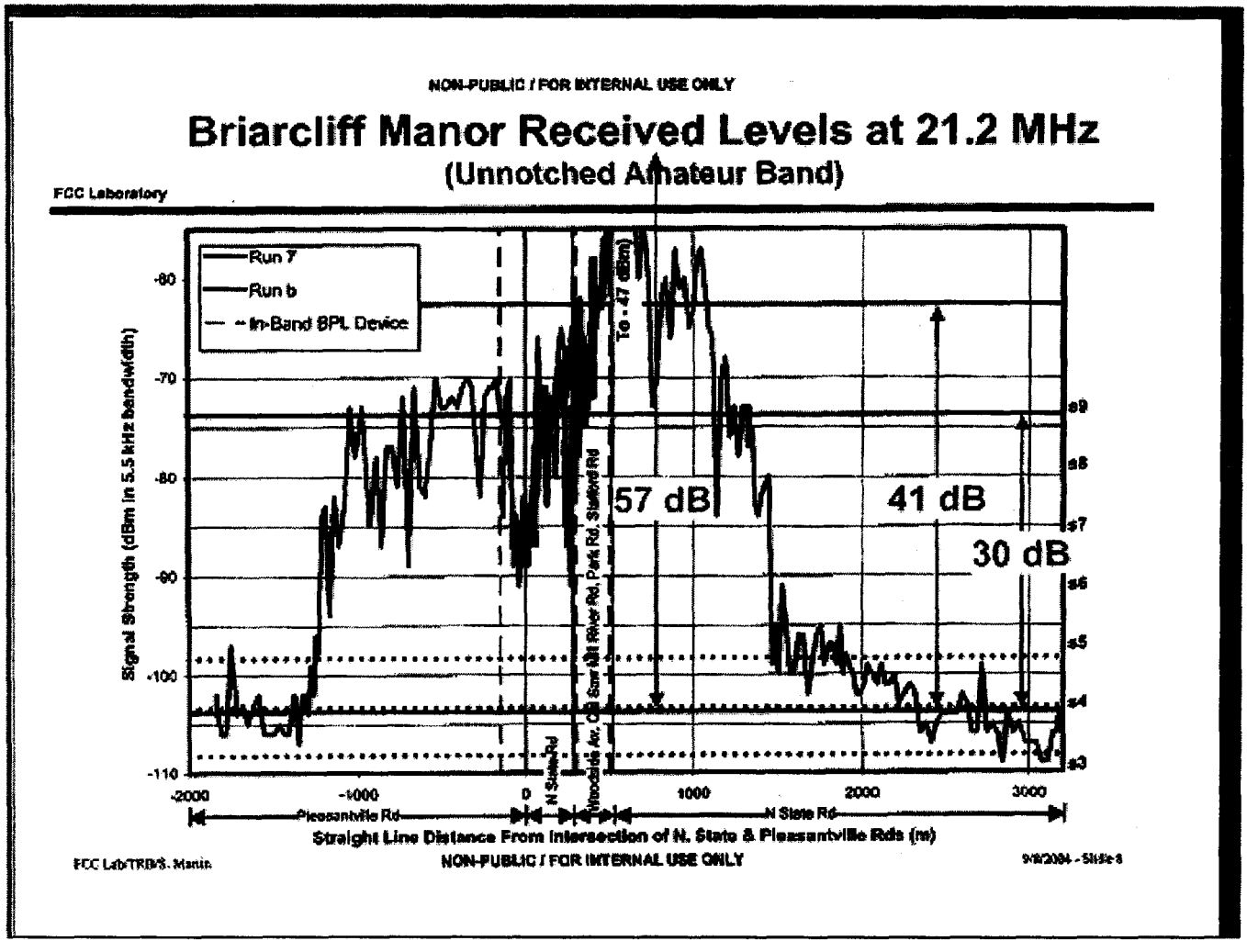

Figure 4 -- This graph shows extremely strong BPL along the line for great distances – typically 1500 meters – from a BPL source on an overhead line. The maximum signal level of –47 dBm is a receiver signal-strength level of approximately S9+26 dB. These data were collected in Briarcliff Manor, NY in un-notched spectrum on 21.2 MHz. It was taken using a receiver and a mobile whip antenna along 5000 meters of overhead power line on 21 MHz. It shows 57 dB degradation of the average ambient noise level in the area and 61 dB of degradation from the minimum ambient noise level shown on the graph. The degradation is more than 30 dB along about 1500 meters of overhead power line. The BPL signal is still degrading weaker signal levels routinely used by stations operating in the Amateur Radio Service more than 2500 meters from the BPL source. The ambient noise level is expressed as a received signal level (RSL) at the receiver, but with the antenna factor of a typical mobile whip on 21 MHz (-0.8 dB/m), the level of ambient noise indicated on this graph of -105 dBm represents a field strength of 3.3 dBuV/m. A receiver's signal strength meter typically responds to peak signals, so this ambient noise level correlates well with the level of 0 dBuV/m that ARRL told the Commission was necessary to protect mobile stations from harmful interference from BPL systems. The minimum RSL shown on

this graph is below –110 dBm, representing a field strength less than 0 dBuV/m. The maximum RSL of –47 dBm represents a field strength of approximately 59 dBuV/m, 10 dB over the FCC limits when extrapolated using the present FCC guidelines for extrapolation.

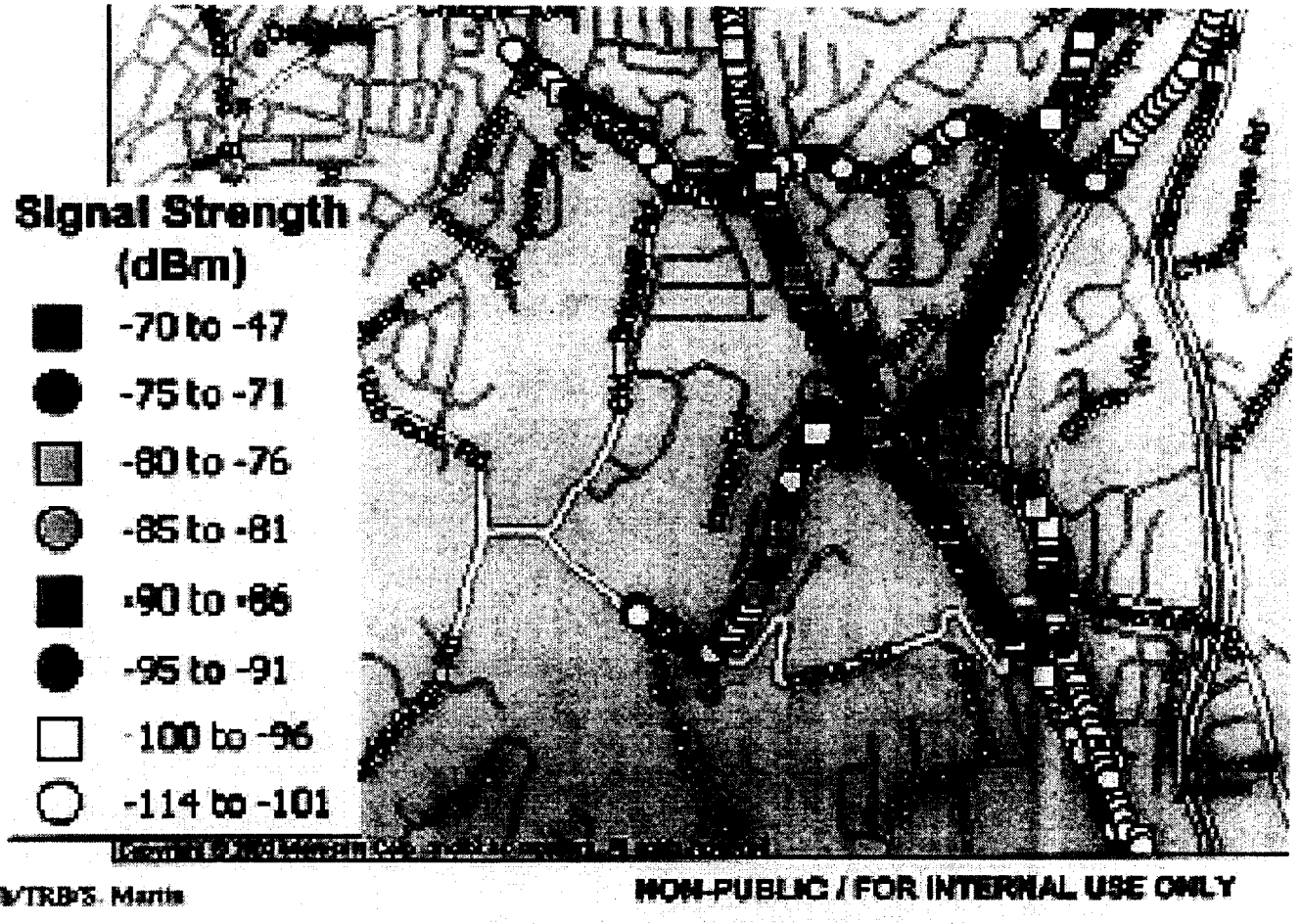

Figure 5 -- These data were collected in Briarcliff Manor, NY. A typical HF mobile whip was used and received signal levels (RSL) in a 5.5 kHz bandwidth were recorded. S9 on a signal strength meter is typically equivalent to an RSL of –73 dBm. S6, still a strong signal, is equivalent to –91 dBm. All areas shown in colored markers on this graph – approximately 1500 meters long -- would result in strong to extremely strong interference to mobile operation along significant lengths of road along the power lines. Some interference would be observed at virtually all points measured on this graph. If fixed amateur stations were located in houses along these roads, the more efficient antennas typically used by fixed stations would result in even stronger BPL RSLs and interference.

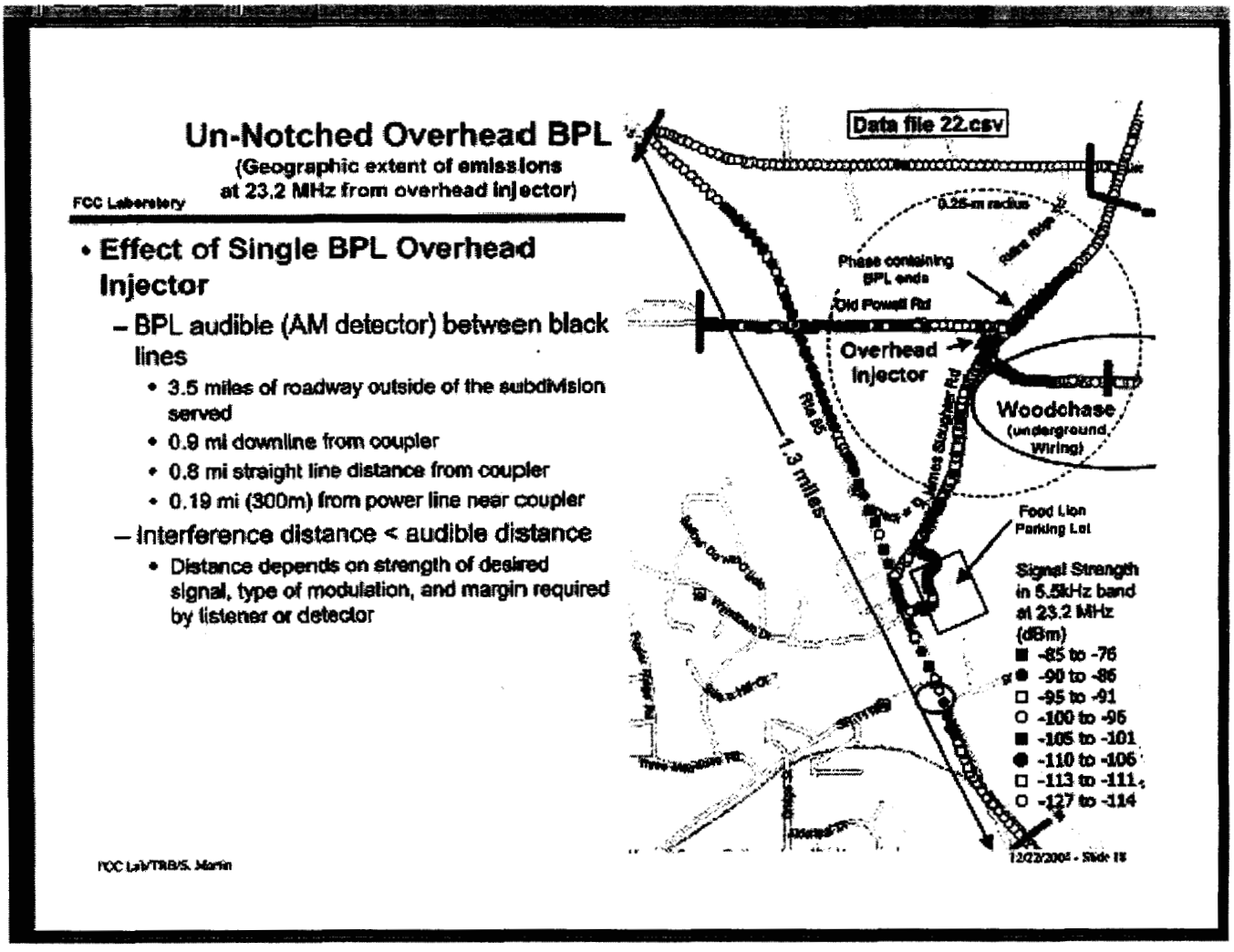

Figure 6-- The Commission found that BPL was clearly heard along 3.5 miles of roadway *outside the subdivision served* with overhead electrical wiring carrying BPL signals. They correctly note that "audible" does not necessarily correlate to interference, but the Amateur Radio Service and others routinely use signals that are just at the ambient noise levels, with no signal/noise margin. The nature of ionospheric propagation is such that otherwise strong signals occasionally are received at much lower levels. That is the very reason for the noise margins built into many communications channel reliability calculations. BPL at these levels will degrade those noise margins considerably, even for services that routinely operate at higher margin levels.

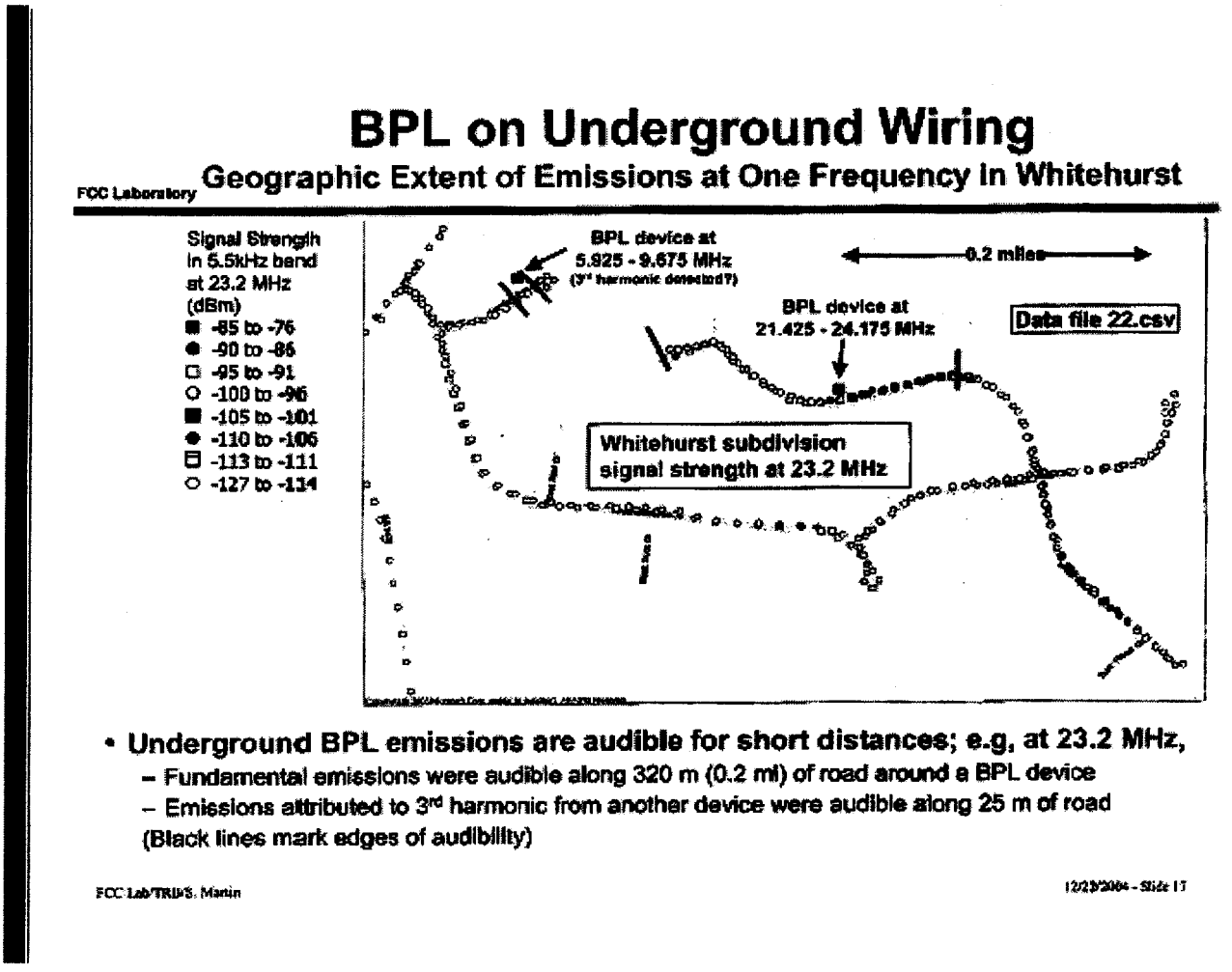

Figure 7 -- Underground wiring is not a reliable protection against widespread interference from BPL. This FCC slide concludes that BPL was only audible a "short distance" from a ground-mounted BPL source. In this graph, the "short distance" was 320 meters – approximately 975 feet. Virtually all amateur fixed or mobile stations would operate within 975 feet of nearby step-down transformers in the United States.

The emissions from BPL equipment can be strong at considerable distance from the source. In addition to the above data that show BPL to be strong for considerable distances along power lines, the FCC test data show generally also that BPL signals can be strong at a considerable distance from the point where BPL equipment is connected to the line. The following slides show examples of the Commission's general concerns about the distances over which BPL signals were strong enough to affect radio services.

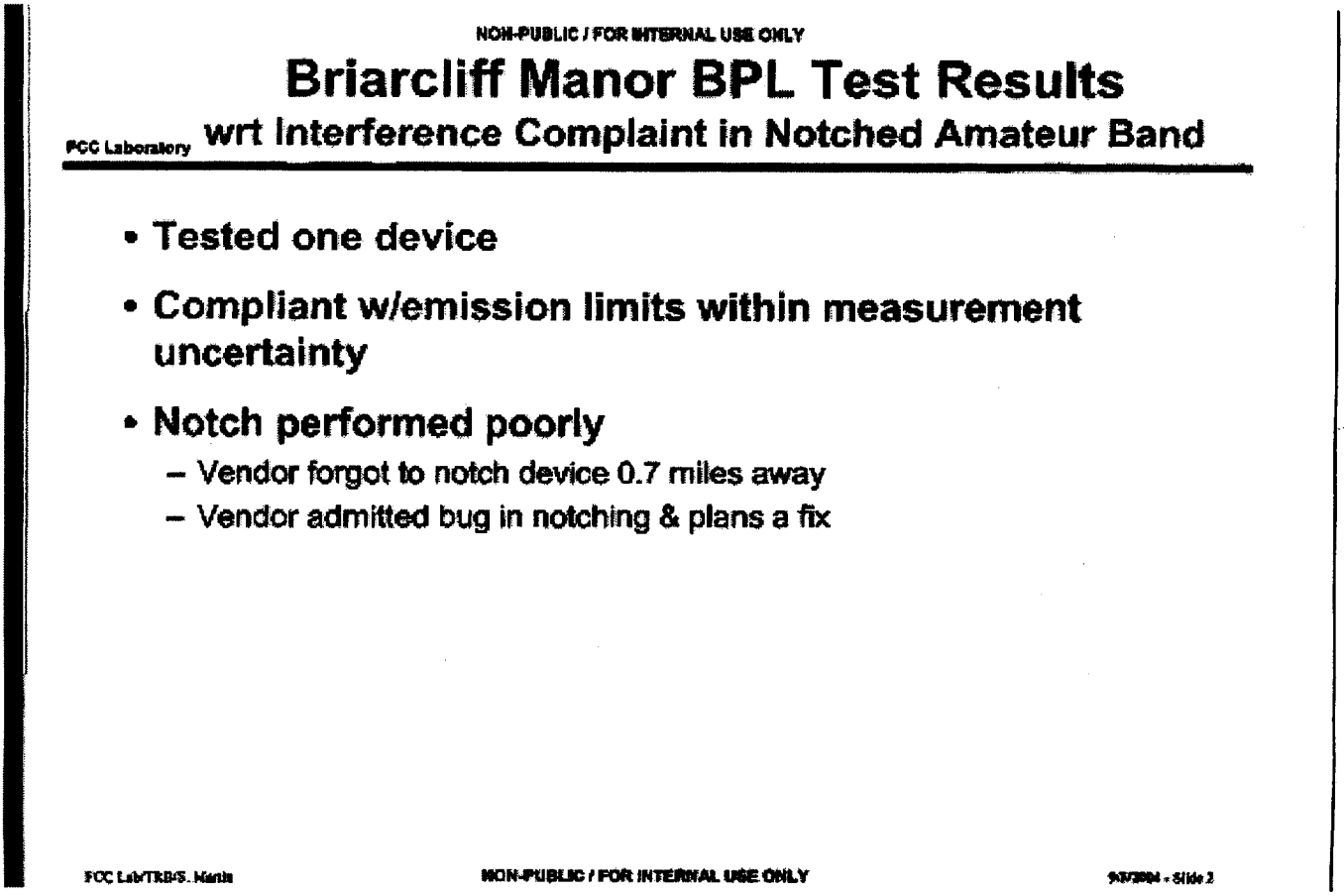

Figure 8 -- This slide shows that a BPL device 0.7 miles away from the measurement point caused signals strong enough at the measurement point to cause the FCC to conclude that the notch in the BPL system in Briarcliff Manor, NY "performed poorly" at the time of the FCC tests.

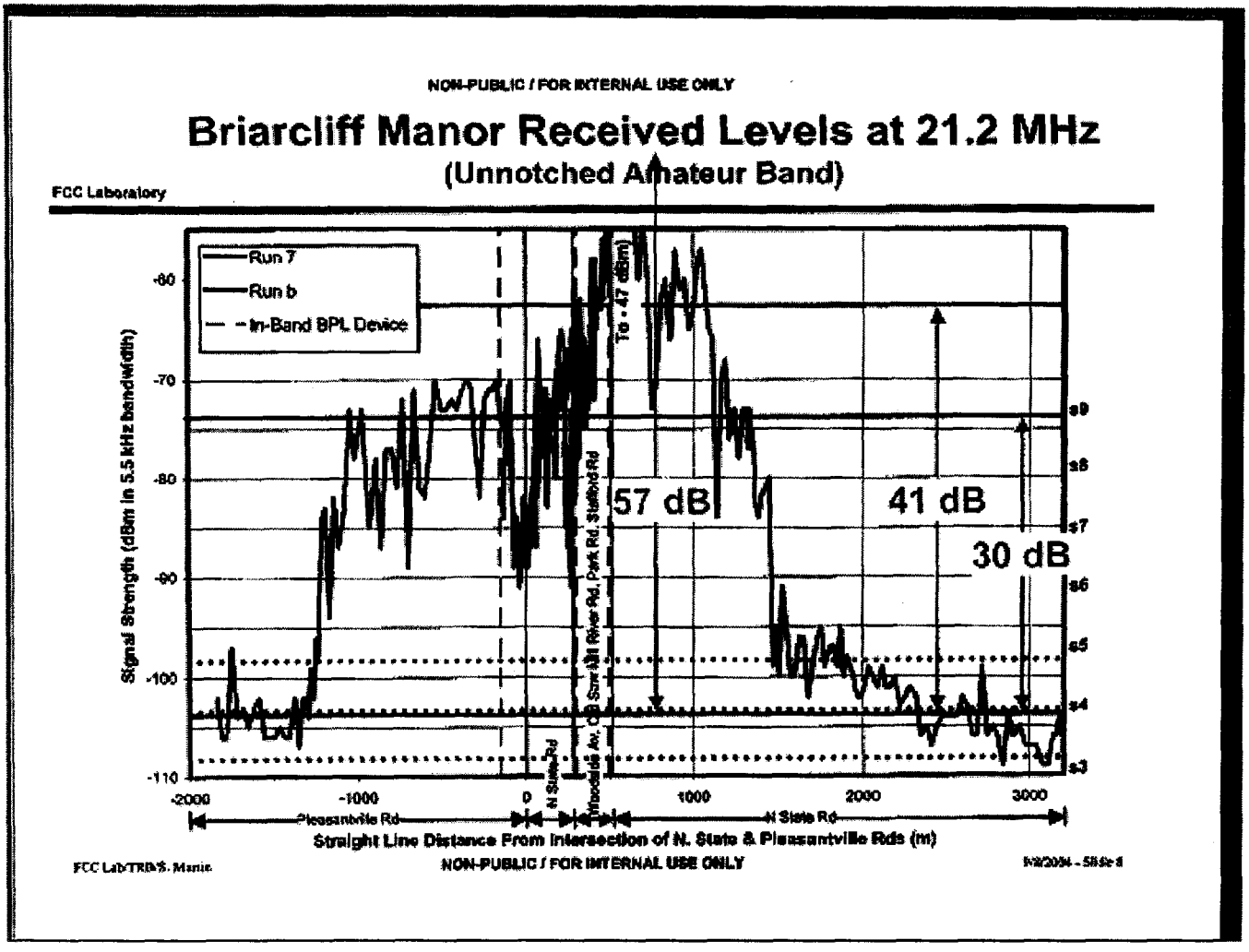

Figure 9 -- This graph shows extremely strong BPL along the line for great distances – typically 1500 meters – from a BPL source on an overhead line. The maximum signal level of –47 dBm is a receiver signal-strength level of approximately S9+26 dB. These data were collected in Briarcliff Manor, NY in un-notched spectrum on 21.2 MHz.

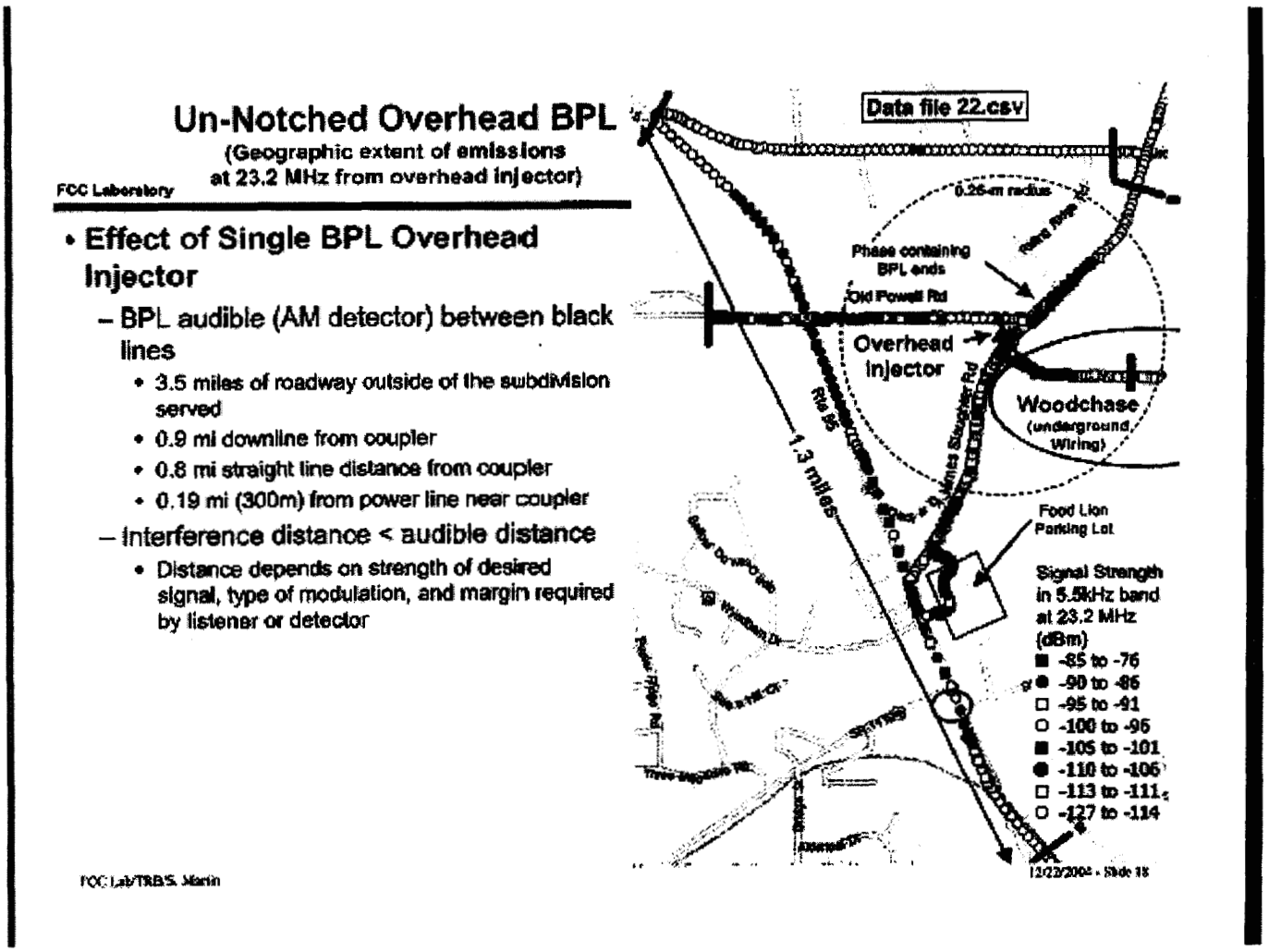

Figure 10 --This graph from the Raleigh, NC report shows that the BPL signal does not stop even when the phase carrying it ends. These strong levels occurred for approximately 0.1 mile past the end of the distribution phase carrying the BPL signal.

The point of maximum emissions from BPL equipment can occur at a considerable distance from the source. In the Report and Order, the FCC concluded that the point of maximum emissions would occur near the BPL source, so instead of requiring BPL manufacturers to search significant distances along the power lines, the FCC allows them to make measurements at a limited number of specific increments along the line near the BPL source.

The fact that the maximum emissions can occur at a considerable distance from the source is dramatically demonstrated in a number of slides in the Commission's

presentations. In these cases, it is clear from the data that measurements made near the Devices Under Test (DUTs) would underestimate the levels at considerable distance along the line. In other cases, the levels near the DUT were strongest, but this is not a consistent phenomenon.

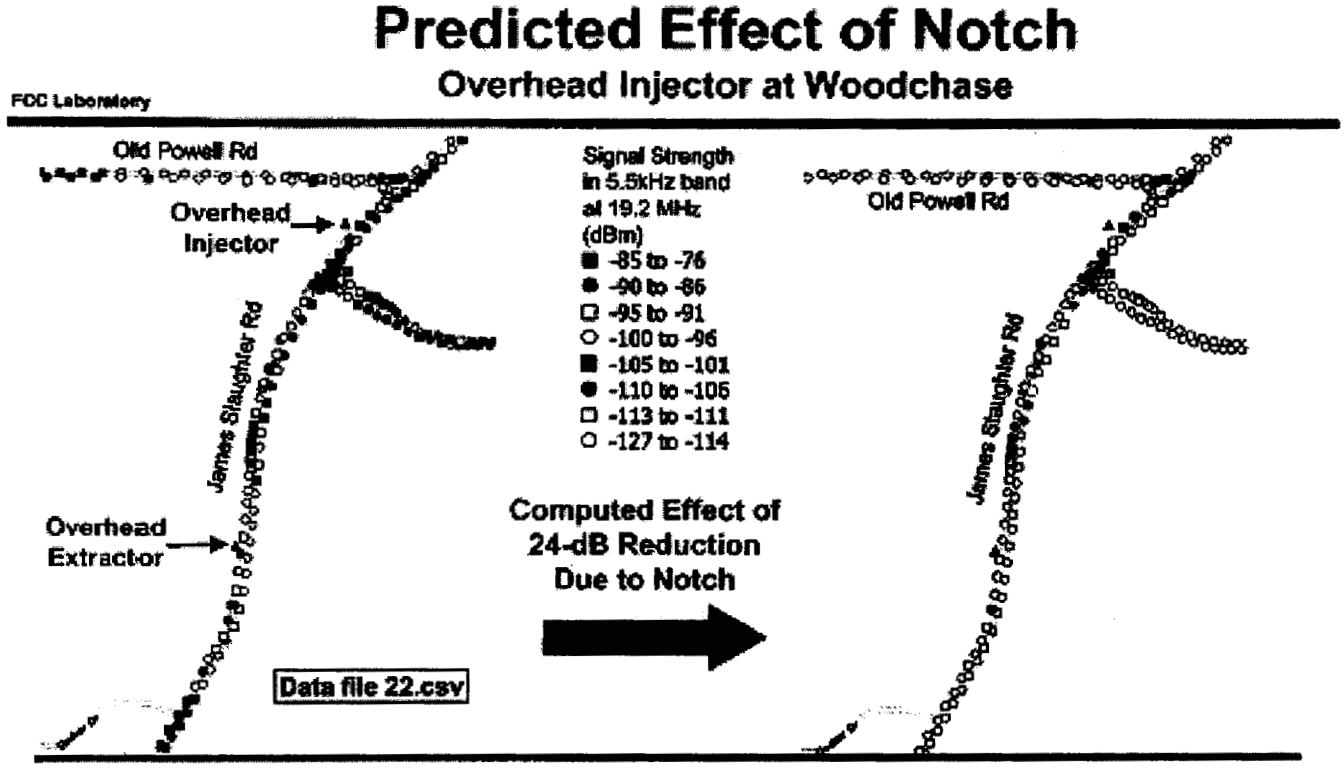

Figure 11 -- This drawing from the FCC report on Raleigh, NC shows that the point of maximum emissions will not necessarily occur near the BPL source. In this case, the BPL source near the junction at the top of the drawing creates stronger emissions near the junction. The BPL source near the center of the long road has maximum emissions shown toward the low end of the drawing. These data ***do not support the FCC conclusion*** that only areas in the immediate vicinity of the injectors require testing. NTIA found similar data in its antenna modeling.

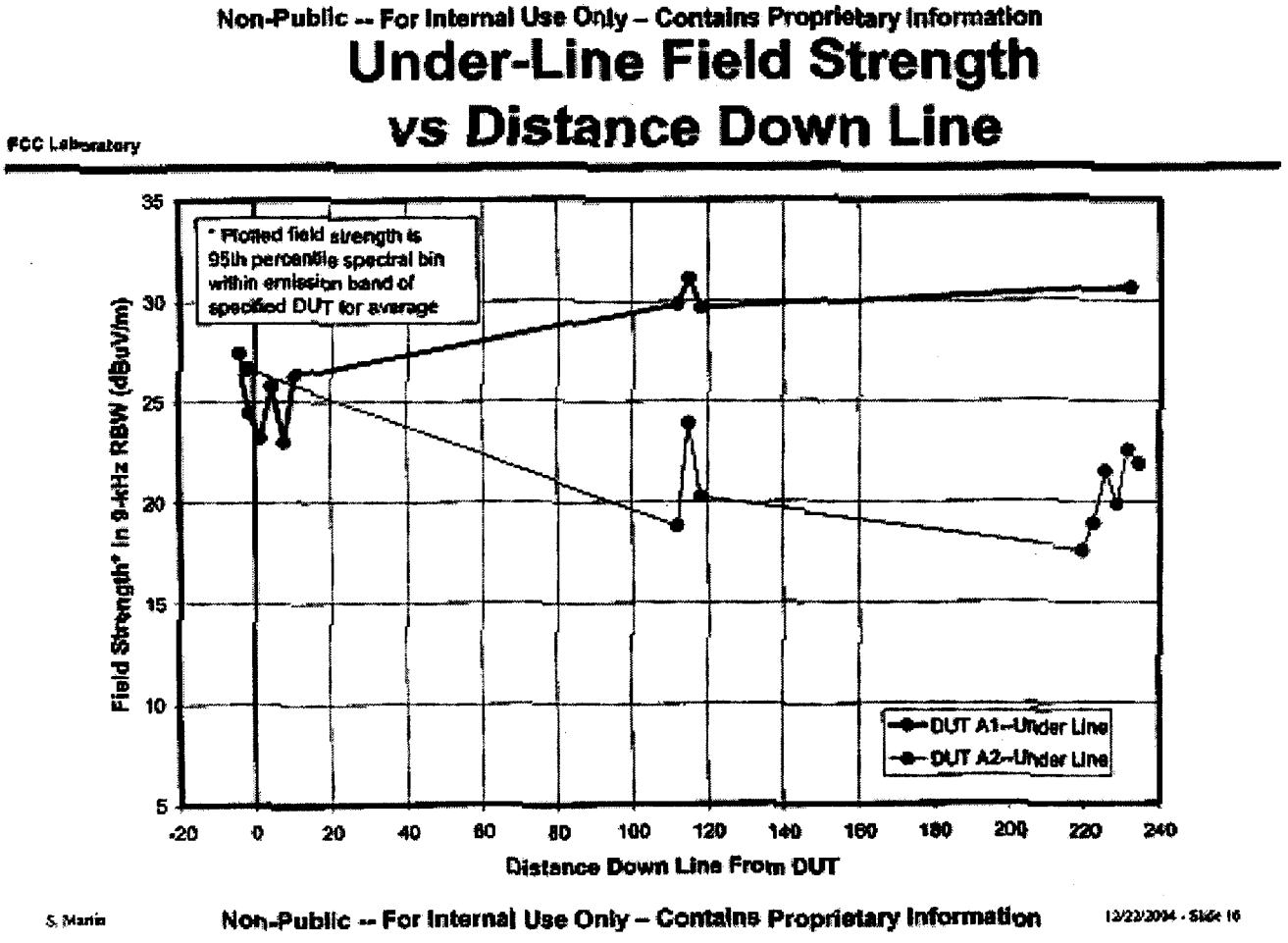

Figure 12 -- These data were generated from the testing performed in Potomac, MD over a frequency of 22 to 31 MHz. On average, the emissions level 230 meters away from the device under test labeled "DUT1" was 5 dB stronger than it was near the device itself.